

connection here. The *Zygaenidæ* do not construct larval cases, and the female is rarely apterous. I imagine that as with *Hepialus*, so here the link may be found in the assumed antiquity of these forms.

I hope that comparison with my former plate will convince my readers that I am justified in holding the Psychides to be entirely separated structurally from suggested relations. It is of course possible even probable that the connecting link or links between the Psychides and the rest of Lepidoptera, may be discovered, as investigation proceeds, and I do not suggest that they shall be erected into a separate Order.

As all the different divisions of Lepidoptera, with the exception of the Tineina, have been at least partially examined, as to the structure of the final segments of the male abdomen, without the desired relationships having been found, it may quite reasonably be supposed that the connecting link, if existing, may yet be discovered in this last group.

(To be continued.)

The Cumberland Coccinellidæ.

By T. F. MARRINER, F.E.S.

When I took up the study of Coleoptera some few years ago under the guidance of Mr. F. H. Day of Carlisle, I soon found that with other interests claiming a large share of my attention it was impossible to do justice all at once to so large a field of study. I spent about 2 hours along with Mr. Day one February afternoon hunting through some flood-refuse and we took between 70 and 80 species in that short time, all of which were then practically new to me. The resultant attempts at identification and classification gave me a sort of mental indigestion, and I then and there decided that if I was to do anything at the subject I must not try to swallow the whole of it at once. Being a Stamp-Collector, and knowing that while the rudiments might be mastered by general collecting, the finer points could only be learned by specialisation, I applied the same principle to the Coleoptera and determined to specialise in one or two families at first. I am told I shall probably have missed no end of good things by taking only one or two particular families, but I am certain I have learnt more. Being somewhat of a garden enthusiast my fancy first turned to the "Lady-birds," as they are popularly called, and I have covered quite a large portion of Cumberland in my quests for these interesting and useful beetles. I am indebted to Mr. Day of Carlisle and Messrs. Donisthorpe and Leman of London for help in classification, and other kind hints.

Of the 41 species of *Coccinellidæ* in the British List, 31 have been recorded for Cumberland and where a species is subject to variation most of the varieties are also present or have been at some time taken.

SUBCOCCINELLA, Huber.

S. 24-punctata, L.—In Vol. III. of the *Carlisle Natural History Society's Transactions* this is recorded as having been taken at Great Salkeld by H. Britten, and by F. H. Day at Drigg. I have specimens taken at Allonby and Port Carlisle by sweeping grass, so that it is probably present at least all along the coast of the county. One of

the specimens taken at Port Carlisle has no spots. Var. *saponariae*, Huber.

HIPPODAMIA, Muls.

H. 13-punctata, L.—There is an old record of this having been taken at Rockcliffe, but it has not been seen recently. The species *variegata*, Goez., is however found along the coast. Of this species some 70 or 80 aberrations have been recorded and 14 of these have turned up in the collections of Mr. Day and myself. No doubt further search will reveal others. Mr. Day first came across *variegata* at Drigg in 1921, and I have three specimens taken at Silloth in September, 1922.

ADALIA, Muls.

A. obliterata, L.—This is common wherever fir-trees are found in the county. The type form which has no spots is not perhaps so common here as are some of the aberration forms given by Weise. Var. *sublimata* is perhaps the commonest form in the area immediately North and East of Carlisle. Var. *fumata* is the only form I have taken in the district just South of Carlisle; a little further South and reaching to Penrith var. *livida* seems the commonest form found. Nearer the coast and in the Lake District, and near the Pennines I have found the typical form most common.

A. bipunctata, L.—This is common though much more so in some seasons than in others, and a tremendously interesting variety may be obtained within the boundaries of the county. I intended writing a few notes on my experiences in breeding this Ladybird, and its hibernation, but after reading the excellent paper on the subject in the *Proceedings of the Zoological Society London*, by Mrs. Merritt Hawkes, M. Sc., of Birmingham, I decided not to do so.

MYSIA, Muls.

M. oblongoguttata, L.—This is common in the county on fir-trees. In my perhaps somewhat limited experience this species varies much more than is commonly supposed. It was by far the commonest "Ladybird" in the county during the summer of 1923 (a wet year) and I was able to watch it work out its life-history from the egg to the perfect insect on the pine trees near my camp. I have, within a few yards of me while writing, a breeding cage wherein a number of these Ladybirds are in hibernation and I am anxiously awaiting their awakening. As what I have to say about *oblongoguttata* would take up too much space here, I must leave it to a later occasion and pass on. In the same wood, on the same tree, though not so numerous, I found *Anatis ocellata*, L., in all stages of its life-history. It is fairly common also wherever there are fir trees in the county. A few years ago I came across a specimen with very pale coloured elytra. Both Mr. Donisthorpe and Mr. Leman to whom I sent it, remarked upon its unusual colour. Last summer I gathered two more specimens, and my camp companion also took two, of the same pale colour exactly. The colour was not due to new emergence for two of these were kept alive for some weeks and did not change, and further, one of a batch of larvae we collected and kept, produced an exactly similar specimen.

COCCINELLA, L.

C. 10-punctata, L.—Is common all over the county lowlands and appears in tremendous variety.

C. hieroglyphica, L.—Also very common wherever there is heather among the fir woods. The county affords quite a nice series of this, varying from the type form to the all-black variety.

C. 11-punctata, L.—This is common in the low-lying portions of the county nearer the coast. Of the aberrations recorded and named from time to time I have taken ab. *confluens*, Haw., ab. *cahiles*, Ws., ab. *9-punctata*, ab. *boreolittoralis*, Donis. These have all kindly been identified for me by Mr. Leman of London. Another specimen submitted was found to be altogether new and as I was asked to name it I gave it the name ab. **lemani** as some slight return for Mr. Leman's kindness and his work on the *Coccinellidae* generally. This new aberration was taken at Burgh on June 3rd, 1922.

C. 5-punctata, L.—One specimen of this was taken in flood refuse near Carlisle many years ago and this with a record by T. C. Heysham (*Steph. Ill.*), were the only known Cumberland captures, until I was fortunate enough to take four specimens when sweeping along the Caldew Valley a few miles from Carlisle, in May, 1922.

C. 7-punctata, L.—This, too, is fairly common in the county. Except in size there is not much in the way of variation to be recorded here. I have one very small specimen taken at Brampton in 1922 and a specimen without spots except the $\frac{1}{2}$ spot at the scutellum, the aberration ab. *lucida* of Weise.

HALYZIA, Muls.

H. 16-guttata, L.—This is very rare in Cumberland. The first record is, I believe, one by T. C. Heysham, for Newby Cross near Carlisle, about 80 years ago. Since then it has been recorded by H. Britten for Penrith neighbourhood, Orton near Carlisle by Mr. Day, and the latest record is my own, taken in the very wood at Newby Cross, where the earliest recorded capture was made.

H. 14-guttata, L.—This is fairly common and often turns up among flood refuse.

H. 18-guttata, L.—Though this is recorded in Mr. Day's County List as common on fir trees, I personally have not found it so, except in two localities.

H. conglobata, L.—Only one record for this exists, an old one made by T. C. Heysham.

H. 22-punctata, L.—This cannot be called uncommon. I have taken it in flood refuse on one occasion when out with Mr. Day. I also had one really lucky day in my search for it. I had looked for it on nettles in vain several times, but came across quite a colony on some oak seedlings by the road-side. My specimens all came from one or other of two localities or from flood refuse.

MICRASPIIS, Redtb.

M. 16-punctata, L.—Also claims inclusion in the Cumberland List on the strength of one old record and *Hyperaspis reppensis*, Hbst. has only three records. It is recorded from Eskdale in Fowler, from Great Salkeld by Britten and from Cumrew Fell by Day. These

localities are well apart; so possibly further search will add to their number. Of the genus *Scymnus* the county has at one time or other produced seven species but only three of these can be called common; further search will probably lead to the discovery of new localities and add to the county list of species. *S. nigrinus*, Kug., *S. discoideus*, Ill., and *S. testaceus* var. *scutellaris*, Muls., I have taken at Orton near Carlisle. Of *S. pygmaeus*, Fourc., there is only one recorded capture, by Mr. Day at Silloth, of *S. capitatus*, F., two old records, one at Baron Wood, by T. C. Heysham and one given by Fowler at Carlisle. *S. frontalis*, F., and *S. haemorrhoidalis*, Hbst., are marked in Mr. Day's List as rare.

CHILOCORUS, Leach.

C. similis, Ross.—I have taken it in company with Mr. Day at Orton near Carlisle. It is also recorded from Penrith area by Mr. Britten.

C. bipustulatus, L.—This is another beetle which I have not yet succeeded in taking in Cumberland, though I am informed that it is quite common in the mosses on the heaths in all parts of the county.

EXOCHOMUS, Redtb.

E. quadripustulatus, L.—Two records exist, an old one for Armathwaite, and a more recent one by Mr. J. Murray for Dalston.

Rhizobius litura, F., and the last on the list *Coccidula rufa*, Hbst., are both commonly taken by the sweep-net among the grasses and other low growing plants.

There is still plenty of work to be done in connection with this group in the county. There are areas yet unexplored, life-histories to work out, and perhaps with patience old records may be confirmed by new captures, and even new species be discovered for the County List.

The Variation in *Larentia (Thera) variata*, Schiff.

By CARL HÖFER of Klosterneuberg (Vienna).

(Translated by Hy. J. TURNER, F.E.S.)

(Continued from page 41.)

ab. *albonigrata*, n. ab., is also a *variata* form with pure white ground colour, which, so far as I know from a search through the literature, has not yet been described.

Among our native *variata* there occur, at the present time specimens with pure white ground-colour and dark almost black discal area, which, on account of their striking colour-contrast, produce a handsome, remarkable form, and which, at the suggestion of Prof. Rebel, I name ab. *albonigrata*. They are in short, ab. *nigrofasciata* with pure white ground colour. I have four examples of it (♂ May 31st, 1917. Hohe Wand, coll., Höfer. ♂ May 23rd, 1904, Hinterberg, Ysper, coll. Priessecker. ♀ ex. ovo August 19th, 1919, Rekawinkel, coll. Priessecker. ♀ May 18th, 1916, Tullnerbach, coll. Galvagni.).

And now with respect to the divergency of the markings.—Let us look somewhat closer at the middle area (transverse band) of the forewings, and we see that this at its lower, narrower extremity towards